CLAIMS

We claim:

1.   In a cellular wireless system having a plurality of sectors, a method of communicating a geographic location of a given sector, so as to facilitate a location-based service with respect to the given sector, the method comprising:

establishing a PI-based location to represent the given sector; and

communicating the PI-based location as a representation of the geographic location of the given sector,

whereby the location-based service is performed based on the PI-based location.

2.   The method of claim 1, wherein location location-based service comprises locating a mobile station positioned in the sector.

3.   The method of claim 1, wherein the location-based service is selected from the group consisting of (i) emergency assistance, (ii) weather reporting, (iii) traffic reporting, (iv) mapping and (v) route planning.

4.   The method of claim 1, wherein the PI-based location comprises a polygon of influence for the given sector with respect to adjacent sectors, the polygon of influence being defined by a plurality of geographic coordinates.

5.   The method of claim 1, wherein the PI-based location comprises a geographic position within a polygon of influence for the given sector, the polygon of influence being defined by a plurality of geographic coordinates.

6.   The method of claim 1, wherein each sector of the plurality of sectors defines a respective geographic origin, and wherein establishing the PI-based location to represent the given sector comprises:

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geometrically establishing a polygon of influence for the origin of the given sector with respect to the origins of adjacent sectors.

7.   The method of claim 6, wherein establishing the polygon of influence for the origin of the given sector with respect to the origins of adjacent sectors comprises:

making a list of connecting lines that connect the origin of the given sector to origins of adjacent sectors;

making a list of potential edge lines including perpendicular bisectors of each connecting line;

clipping the potential edge lines where they intersect each other, and retaining as edge lines a piece of each clipped potential edge line closest to the origin of the given sector; and

connecting the edge lines so as to form the polygon of influence.

8.   The method of claim 6, wherein the PI-based location comprises the polygon of influence.

9.   The method of claim 6, wherein establishing the PI-based location to represent the given sector further comprises:

establishing as the PI-based location a representative point within the polygon of influence.

10.   The method of claim 9, wherein establishing a representative point within the polygon of influence comprises:

selecting a center point of a minimum bounding rectangle around the polygon of influence.

11.   A method of communicating mobile station location in a cellular wireless system, the cellular wireless system having a plurality of sectors, the method comprising:

determining that a mobile station is located in a given sector of the plurality of sectors;

establishing a PI-based location to represent the given sector; and

communicating the PI-based location as a representation of where the mobile station is located.

12.   The method of claim 11, wherein the PI-based location comprises a polygon of influence for the given sector with respect to adjacent sectors, the polygon of influence being defined by a plurality of geographic coordinates.

13.   The method of claim 11, wherein the PI-based location comprises a geographic position within a polygon of influence for the given sector, the polygon of influence being defined by a plurality of geographic coordinates.

14.   The method of claim 11, further comprising:

maintaining data that correlates each sector of the plurality of sectors with a respective PI-based location,

wherein, establishing the PI-based location to represent the given sector comprises using the data to identify a PI-based location for the given sector.

15.   The method of claim 14, wherein the data comprises a database table in which each record indicates a PI-based location for a respective sector.

16.   The method of claim 11, wherein each sector of the plurality of sectors defines a respective geographic origin, and wherein establishing the PI-based location to represent the given sector comprises:

geometrically establishing, as the PI-based location, a polygon of influence for the origin of the given sector with respect to the origins of adjacent sectors.

17.   The method of claim 16, wherein establishing the polygon of influence for the origin of the given sector with respect to the origins of adjacent sectors comprises:

making a list of connecting lines that connect the origin of the given sector to origins of adjacent sectors;

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making a list of potential edge lines including perpendicular bisectors of each connecting line;

clipping the potential edge lines where they intersect each other, and retaining as edge lines a piece of each clipped potential edge line closest to the origin of the given sector; and

connecting the edge lines so as to form the polygon of influence.

18. The method of claim 11, wherein each sector of the plurality of sectors defines a respective geographic origin, and wherein establishing the PI-based location to represent the given sector comprises:

geometrically establishing a polygon of influence for the origin of the given sector with respect to the origins of adjacent sectors; and

establishing as the PI-based location a representative point within the polygon of influence.

19. The method of claim 18, wherein establishing the polygon of influence for the origin of the given sector with respect to the origins of adjacent sectors comprises:

making a list of connecting lines that connect the origin of the given sector to origins of adjacent sectors;

making a list of potential edge lines including perpendicular bisectors of each connecting line;

clipping the potential edge lines where they intersect each other, and retaining as edge lines a piece of each clipped potential edge line closest to the origin of the given sector; and

connecting the edge lines so as to form the polygon of influence.

20. The method of claim 18, wherein establishing a representative point within the polygon of influence comprises:

selecting a center point of a minimum bounding rectangle around the polygon of influence.

21. The method of claim 11, wherein establishing the PI-based location to represent the given sector comprises:

(a) establishing PI-based locations for all of the sectors;

(b) storing the PI-based locations in a data file; and

(c) using the data file to identify a PI-based location for the given sector.

22. The method of claim 21, further comprising repeating steps (a) and (b) periodically.

23. The method of claim 21, wherein each of the sectors defines a respective geographic origin, and wherein establishing PI-based locations for all of the sectors comprises, for each of the sectors:

geometrically establishing, as the PI-based location for the sector, a polygon of influence for the origin of the sector with respect to the origins of adjacent sectors.

24. The method of claim 23, wherein establishing the polygon of influence for the origin of the sector with respect to the origins of adjacent sectors comprises:

making a list of connecting lines that connect the origin of the sector to origins of adjacent sectors;

making a list of potential edge lines including perpendicular bisectors of each connecting line;

clipping the potential edge lines where they intersect each other, and retaining as edge lines a piece of each clipped potential edge line closest to the origin of the sector; and

connecting the edge lines so as to form the polygon of influence.

25. The method of claim 21, wherein each of the sectors defines a respective geographic origin, and wherein establishing PI-based locations for all of the sectors comprises, for each sector:

geometrically establishing a polygon of influence for the origin of the sector with respect to the origins of adjacent sectors; and

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establishing as a PI-based location for the sector a representative point within the polygon of influence.

26.   The method of claim 25, wherein establishing the polygon of influence for the origin of the sector with respect to the origins of adjacent sectors comprises:

making a list of connecting lines that connect the origin of the given sector to origins of adjacent sectors;

making a list of potential edge lines including perpendicular bisectors of each connecting line;

clipping the potential edge lines where they intersect each other, and retaining as edge lines a piece of each clipped potential edge line closest to the origin of the sector; and

connecting the edge lines so as to form the polygon of influence.

27.   The method of claim 25, wherein establishing a representative point within the polygon of influence comprises:

selecting a center point of a minimum bounding rectangle around the polygon of influence.

28.   The method of claim 11, wherein communicating the PI-based location as a representation of where the mobile station is located comprises:

storing the PI-based location in a data store accessible to a recipient entity,

whereby the recipient entity accesses the data store and obtains the PI-based location from the data store.

29.   The method of claim 11, wherein communicating the PI-based location as a representation of where the mobile station is located comprises:

transmitting the PI-based location to a location-based service provider in response to a request for a location of the mobile station.

30. The method of claim 29, wherein the location-based service provider comprises an emergency service entity.

31. The method of claim 11, wherein communicating the PI-based location as a representation of where the mobile station is located comprises:

transmitting the PI-based location to a location-based service system when establishing a communication session between the mobile station and the location-based service system.

32. The method of claim 31, wherein the location-based service system comprises an emergency service entity.

33. The method of claim 31, wherein transmitting the PI-based location to a location-based service system when establishing a communication session between the mobile station and the location-based service system comprises:

receiving a request to establish the communication session; and

responsively transmitting the PI-based location to the location-based service system and processing a set-up of the communication session,

whereby, upon establishment of the communication session, the location-based service system has the PI-based location.

34. The method of claim 31, wherein transmitting the PI-based location to a location-based service system when establishing a communication session between the mobile station and the location-based service system comprises:

receiving a request to establish the communication session; and

sending the PI-based location to the location-based service system in a session setup message,

whereby, upon establishment of the communication session, the location-based service system has the PI-based location.

35. A method comprising:

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determining that a mobile station is located in a given sector of a cellular wireless system;

selecting a PI-based location to represent the given sector; and

performing a service based on the PI-based location.

36.   A system for communicating mobile station location in a cellular wireless system, the cellular wireless system having a plurality of sectors, the mobile station being located in a given sector of the plurality of sectors, the system comprising:

means for establishing a PI-based location to represent the given sector; and

means for communicating the PI-based location as a representation of where the mobile station is located.

37.   The system of claim 36, wherein each sector of the plurality of sectors defines a respective geographic origin, and wherein the means for establishing a PI-based location to represent the given sector comprises:

a processor;

a data storage medium;

machine language instructions stored in the data storage medium and executable by the processor to geometrically establish a polygon of influence for the origin of the given sector with respect to the origins of adjacent sectors.

38.   The system of claim 37, wherein, to geometrically establish a polygon of influence for the origin of the given sector with respect to the origins of adjacent sectors, the processor performs functions comprising:

making a list of connecting lines that connect the origin of the given sector to origins of adjacent sectors;

making a list of potential edge lines including perpendicular bisectors of each connecting line;

clipping the potential edge lines where they intersect each other, and retaining as edge lines a piece of each clipped potential edge line closest to the origin of the given sector; and

connecting the edge lines so as to form the polygon of influence.

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39. The system of claim 38, wherein the PI-based location comprises the polygon of influence.

40. The system of claim 38, wherein the functions further comprise:

establishing as the PI-based location a representative point within the polygon of influence.

41. The system of claim 40, wherein establishing a representative point within the polygon of influence comprises:

selecting a center point of a minimum bounding rectangle around the polygon of influence.

42. The system of claim 37, wherein the means for communicating the PI-based location as a representation of where the mobile station is located comprises:

machine language instructions stored in the data storage medium and executable by the processor to transmit the PI-based location to a recipient entity.